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Survey of rove beetles (Coleoptera, Staphylinidae) from Stanley Park, Vancouver, British Columbia, Canada, with new records and description of a new species. Part 1

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Abstract

The first survey of rove beetle species from Stanley Park, Vancouver, British Columbia, Canada is presented. Thirty-five species are reported from the following subfamilies: Aleocharinae (14), Micropeplinae (1), Omaliinae (7), Oxytelinae (2), Paederinae (1), Proteininae (2), Pselaphinae (1), Staphylininae (3), and Tachyporinae (4). All species are listed in Table 1. One new species, *Oxypoda stanleyi* Klimaszewski & McLean, **sp. n.**, is described and illustrated and three new adventive aleocharine species are recorded for the first time from British Columbia. They are: *Dalotia coriaria* (Kraatz), *Mocyta fungi* (Gravenhorst), and *Oxypoda opaca* (Gravenhorst). These exotic species were previously known from the Palaearctic region, eastern Canada, and the United States.

Keywords

British Columbia, Canada, Coleoptera, new species, Staphylinidae, Stanley Park, survey, Vancouver

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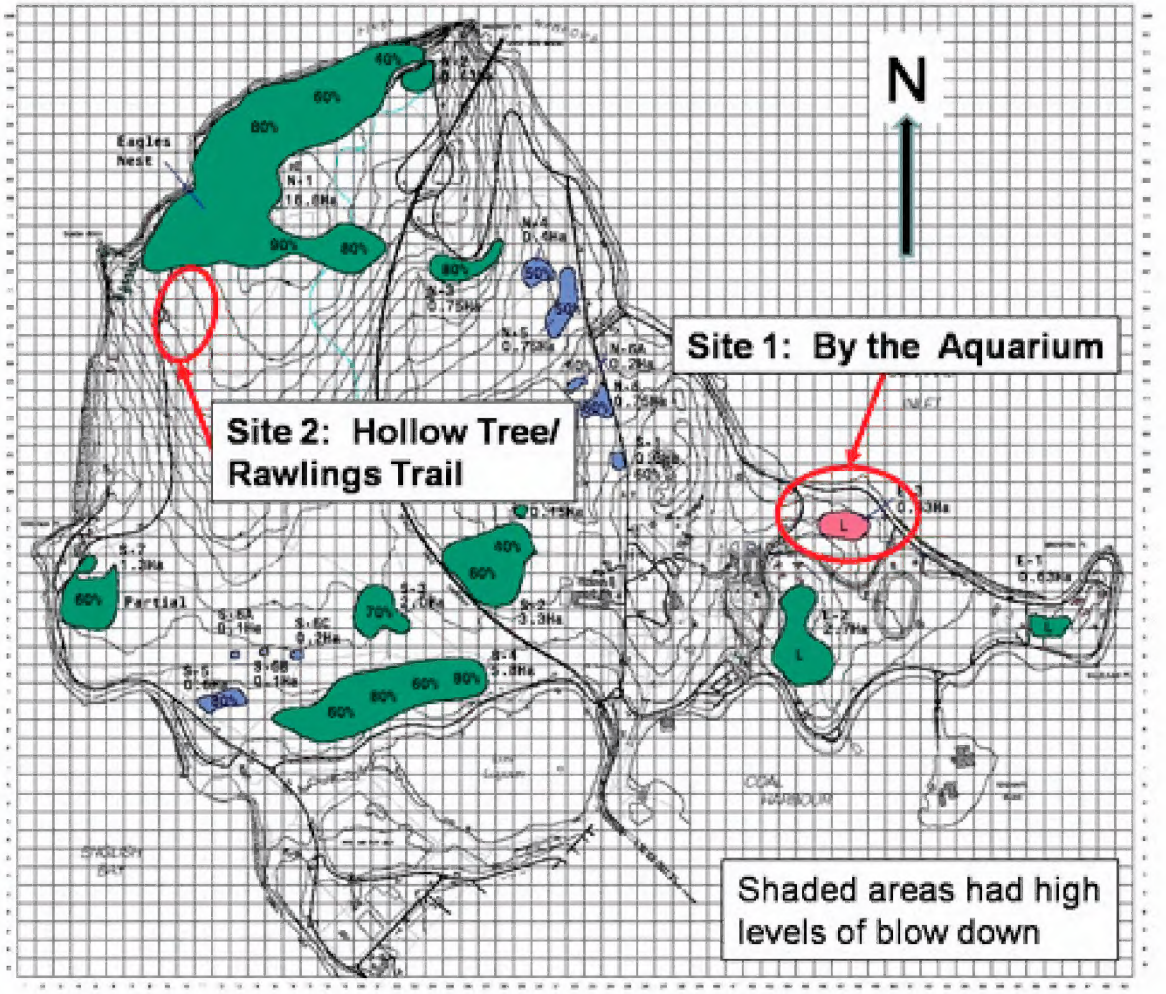
Introduction

As part of the Stanley Park, Vancouver, restoration plan it was proposed to survey the forest insects that could be at special risk as a result of tree damage from the winter storm in December 2006, and accumulation of the very large amount of coarse woody debris (Map 1). There is concern that some exotic insects might also become established in the areas with severe tree damage. The results of this survey are from sampling conducted in the undamaged part of the Stanley Park forest. They constitute the baseline data, which will be used for comparison with rove beetle samples collected in the severely damaged forest of the park, and will be published in a separate contribution as part 2.

As very little is known about the insect diversity in the Park, a sampling and monitoring program was undertaken to determine what species of insect are present. A series of pitfall traps were set out, in addition to other sampling methods, to survey for ground and rove beetle populations. The results of rove beetle collecting are presented in this contribution. The trapping yielded 35 species of Staphylinidae (Table 1), including one species new to science, *Oxypoda stanleyi* Klimaszewski & McLean, sp. n., and three adventive aleocharine species, *Dalotia coriaria* (Kraatz), *Mocyta fungi* (Gravenhorst) and *Oxypoda opaca* (Gravenhorst), recorded for the first time from British Columbia.



Map 1. Map of Stanley Park, Vancouver, British Columbia, showing collecting locations for the 2007 insect survey.

Study locations

Two undamaged sites in Stanley Park, site A and site B [49°18′02″N, 123°07′04″W; 49°18′22″N, 123°09′11″W respectively], were designated for trapping insects (Map 1). Site A was located in an area adjacent to the Vancouver Aquarium and site B was along the Rawlings Trail near the Hollow Tree Reserve. The Vancouver Aquarium site consisted of a closed canopy second-growth forest, mainly Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco), with a bare forest floor with old needles and some ivy around trap site 1. The Hollow Tree site consisted of a closed canopy second-growth stand of mainly western hemlock (*Tsuga heterophylla* (Raf.) Sarg.) and a few Douglas-fir and western cedar (*Thuja plicata* Donn ex D. Don) with a bare forest floor with old needles. Traps were set out on April 20, 2007 and operated during the summer months. At each site, four Lindgren multiple funnel traps, a flight-intercept trap, and a pitfall trap near each of the hanging traps were set up. Polypropylene glycol was used in all traps for preserving captured insects. The Lindgren traps were baited with specific pheromones, ethanol lures, and alpha-pinene lures. The pitfall traps were unbaited.

The following main references were consulted for the identification of rove beetles: Campbell (1973), Hatch (1957), Newton et al. (2000), Smetana (1971, 1976), Klimaszewski (2000), Klimaszewski and Winchester (2002), Klimaszewski et al. (2001, 2004, 2006, 2007).

Material examined

More than 160 adult rove beetles were examined, 11 of which were dissected. The genital structures were dehydrated in absolute alcohol and mounted in Canada balsam on celluloid microslides and pinned with the specimens from which they originated. The photographs of the entire body of *Oxypoda stanleyi* and the genital structures were taken using an image processing system (Nikon SMZ 1500 stereoscopic microscope; Nikon digital camera DXM 1200f; and Adobe Photoshop software).

Terminology mainly follows that employed by Seevers (1978). The ventral part of the median lobe of the aedeagus is considered to be the part of the bulbus containing the foramen mediale, the entrance of the ductus ejaculatorius, and the adjacent venter of the tubus; the opposite side is referred to as the dorsal part.

Conventions

Authorship of a new taxon. Authorship of a new taxon is attributed to Klimaszewski, J. and McLean, J. alone.

Repository abbreviations:

CNC Canadian National Collection of Insects, Arachnids, and Nematodes, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada

LFC Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Quebec City, Quebec, Canada

UBC University of British Columbia, Spencer Entomological Collection, Beaty Biodiversity Museum, Vancouver, British Columbia, Canada

UNH University of New Hampshire, Department of Zoology, Durham, New Hampshire, USA

Systematics

Tribe Oxypodini Thomson, 1859

Genus *Oxypoda* Mannerheim, 1830

For literature review and diagnosis, see Klimaszewski et al. 2006.

1. *Oxypoda stanleyi* Klimaszewski & McLean, sp. n.

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Figs 1–9

HOLOTYPE (male): CANADA, British Columbia, Vancouver, Stanley Park, Hollow Tree, CWH, 49°18′22″N, 123°09′11″W, pitfall trap #5, 29.IV-10 V. 2007, J.A. McLean, A. Li, J. Derhousoff; Staphylinidae A. Li I, 2008 (LFC). **PARATYPES**: labelled as the holotype (LFC) 2 males, 1 female, funnel trap #4 (UBC) 1 female; same labels as the holotype except: 10.V-23.V.2007, pitfall #5 (LFC) 1 male; 20.VI-29.VI.2007, pitfall #5 (LFC) 1 male, (UBC) 2 males; 10.VII-31.VII.2007, pitfall #5 (LFC) 1 female; Vancouver, Stanley Park, Vancouver Aquarium, 49°18′02″N, 123°07′04″W, pitfall trap #1, 20.IV-29.IV.2007, pitfall #1, J.A. McLean, A. Li, J. Derhousoff (LFC) 1 male; same data except: 29.IV-10.V.2007, pitfall #1 (LFC) 1 male; 10.V-23.V.2007, pitfall #4 (LFC) 2 males, (UBC) 5 males, 1 female; 23.V-7.VI.2007, pitfall #5 (LFC) 1 female, (UBC) 2 males; 19.VI-10.VII.2007, pitfall #4 (LFC) 1 male, (UBC) 2 females.

Etymology. This species is named for the type locality where the original specimens were captured. Stanley Park was formally opened in 1888 by Lord Stanley, Earl of Preston, the Governor General of Canada (Steele 1988).

Diagnosis. *Oxypoda stanleyi* may be distinguished from the remaining Nearctic species of *Oxypoda* by the following features: body narrowly oval, rust-brown with dark brown head and at least posterior third of abdomen, forebody with scarcely visible microsculpture, length 1.6–1.9 mm, antennae strongly thickened and incrassate (Fig.

Figure 1. *Oxypoda stanleyi* Klimaszewski & McLean, sp. n., dorsal habitus.

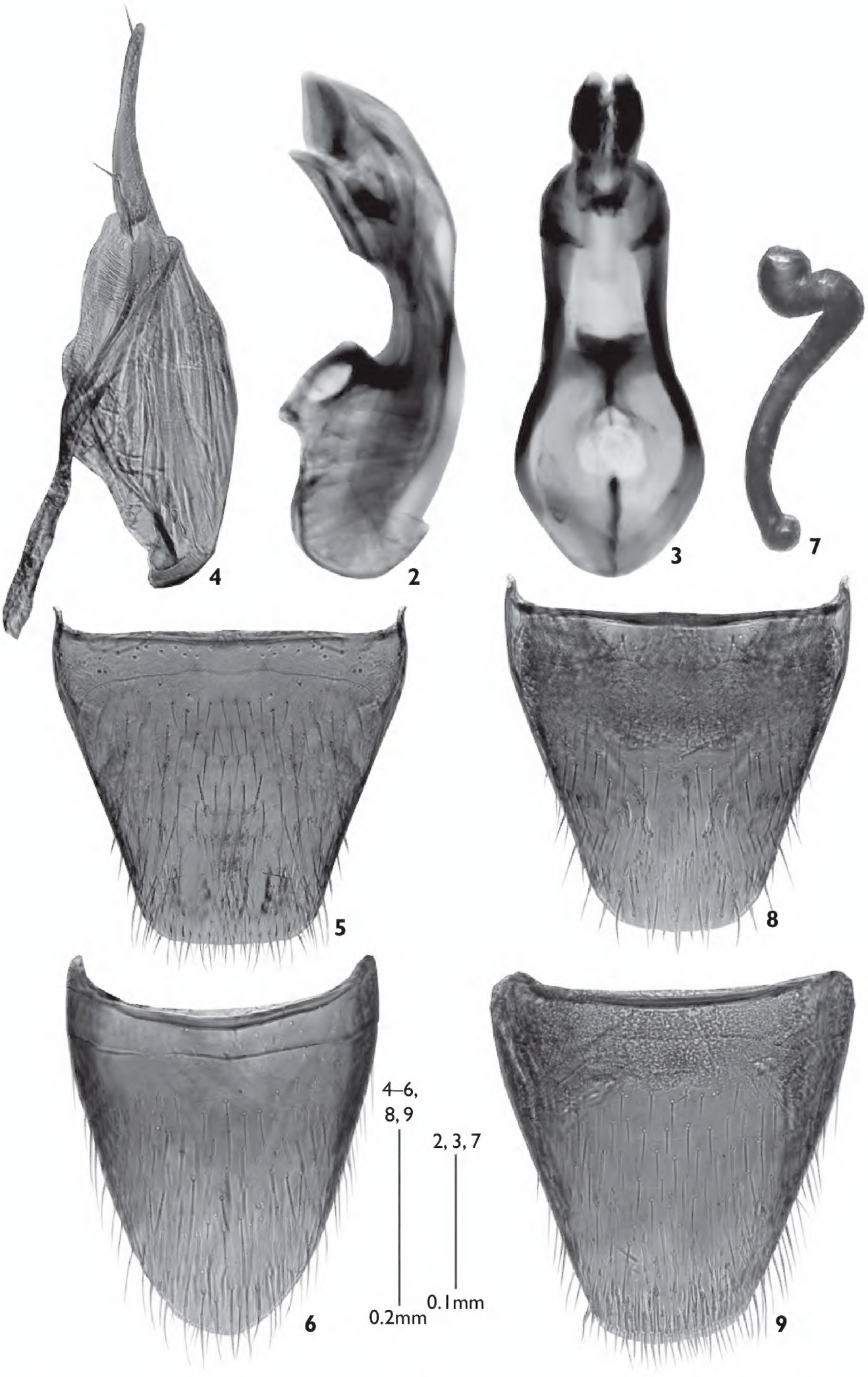
1), median lobe of aedeagus and spermatheca of a characteristic shape (Figs. 2, 3, 7). Known to occur in coastal British Columbia.

Description. Body small, reddish-brown with dark brown head and at least posterior half of abdomen; length 1.6–1.9 mm, approximately narrowly oval, slightly broadest at middle of elytra, abdomen subparallel basally and gradually narrowed posterad (Fig. 1); forebody with scarcely visible microsculpture, sculpticells of flattened hexagonal shape; integument moderately glossy; pubescence sparse on head and abdomen and denser elsewhere (Fig. 1). Head (Fig. 1) broadest at posterior eye level, narrower than pronotum, pubescence directed anterad centrally and slightly obliquely laterad laterally, frontal suture and infraorbital carina strong; eyes moderately sized, approximately as long as postocular area; antennae strongly swollen, articles 4–9 strongly transverse and incrassate (Fig. 1); maxillary palpus with 4 articles, last one needle-shaped; labial palpus with 3 articles; glossae separated, V-shaped; pronotum moderately convex, strongly transverse and slightly narrower than elytra at maximum width, ratio of maximum pronotal width/length 1.3, pubescence directed straight posterad along midline of disc and obliquely posteriorly elsewhere (Fig. 1); elytra slightly broader at middle than pronotum and at suture slightly shorter than pronotum, pubescence directed approximately straight to slightly obliquely posterad (Fig. 1); abdomen subparallel basally and slightly tapering apically; three basal tergites with strong basal impressions; metatarsus with basal article elongate and at least as long as two following articles combined. **Male.** Tergite 8 slightly transverse, truncate apically, antecostal suture slightly sinuate medially (Fig. 5). Sternite 8 slightly elongate, rounded apically, antecostal suture slightly sinuate medially (Fig. 6). Median lobe of aedeagus with moderately sized bulbus and subparallel tubus abruptly tapering apically in dorsal view (Fig. 3); venter of tubus arcuate basally and straight subapically ending sharply in lateral view (Fig. 2); crista apicalis large (Fig. 2); internal sac with complex structures (Figs. 2, 3); paramere with narrow and elongate apical lobe, subapical and basal setae moderately long (Fig. 4). **Female.** Tergite 8 similar to that of male (Fig. 8). Sternite 8 approximately as long as wide, truncate apically, antecostal suture straight medially (Fig. 9). Spermatheca with small spherical capsule with invagination facing up and long and narrow sinuate stem (Fig. 7).

Distribution. *Oxypoda stanleyi* is known only from Stanley Parkm in Vancouver, British Columbia.

Collection and habitat data. Adults were collected from April through July using pitfall traps and one specimen was captured in a funnel trap. The majority of specimens were captured in May. The thick antennae indicate that this species may be affiliated with ants, but this needs to be confirmed by field observations.

Comments. *Oxypoda stanleyi* is distinct from other Nearctic species of *Oxypoda* by the short macrosetae on the apical tergites and sternites 8 (Figs. 5, 6, 8, 9), and by its swollen antennae. Due to these characteristics it should be assigned to a species group of its own. Externally, except for the swollen antennae, it resembles the species from the *Inimica* species group described by Klimaszewski et al. (2006). It keys to couplet 2



Figures 2–9. Genital structures and terminalia of *Oxypoda stanleyi* (**2–6** male): **2** median lobe of aedeagus in lateral, and dorsal view **3**, **4** paramere **5** tergite 8 **6** sternite 8 (**7–9** female): **7** spermatheca **8** tergite 8 **9** sternite 8.

in Klimaszewski et al. (2006), which should be modified as follows to accommodate this species:

Key to *Oxypoda* species occurring in Canada and Alaska

2 Body length 1.6–1.9 mm, antennae strongly swollen, articles 9 and 10 more than twice as broad as long (Fig. 1), known to occur in coastal British Columbia ..... ***O. stanleyi* sp. n.**

– Body length 2.2–3.2 mm, antennae moderately swollen, articles 9 and 10 usually less than twice as broad as long, known from western and northern Canada **3**

2. *Oxypoda opaca* (Gravenhorst)
(For illustrations and details, see Hoebeke 1989 and Klimaszewski et al. 2006).

CANADA. British Columbia: Vancouver, Stanley Park, Vancouver Aquarium, CWH (49°18′02″N, 123°07′04″W), Funnel trap 1, 29.IV-10.V.2007, J.A. McLean, A. Li, J. Derhousoff (UBC) 1 male.

Oxypoda opaca is a widespread Palaearctic species previously recorded in North America in the United States from North and South Carolina, New York, and Vermont (Hoebeke 1989). It was first recorded in Canada from Ontario and Nova Scotia (Klimaszewski et al. 2006). This species is here newly recorded from British Columbia.

Tribe Athetini Casey, 1910
(For literature review and diagnosis, see Klimaszewski and Winchester 2002).

3. *Dalotia coriaria* (Kraatz)
(For diagnosis, illustrations and literature reviews, see Klimaszewski et al. 2007, Gouix and Klimaszewski 2007).

CANADA. British Columbia: Vancouver, Stanley Park, Hollow Tree, CWH (49°18′22″N, 123°09′11″W), Funnel trap 2, 10.VII-31.VII.2007, J.A. McLean, A. Li, J. Derhousoff (UBC) 1 male.

Dalotia coriaria is a cosmopolitan species that is adventive in many parts of the world including Europe, east Africa, Madagascar, New Zealand, Galapagos Islands (Benick and Lohse 1974; Pace 1999; Sivasubramaniam et al. 1997; Klimaszewski and Peck 1998), and North America (Klimaszewski et al. 2007). In Canada it has previously been recorded from Ontario and Alberta (Klimaszewski et al. 2007, Gouix and Klimaszewski 2007), and in the United States from California, Florida, Louisiana,

Massachusetts, New Jersey and New York (Moore and Legner 1975; Muona 1984; Frank 1980; Gusarov 2003). This species is here newly recorded from British Columbia. The isolated and disjunctive distribution of *D. coriaria* in Canada represents probably three independent introduction events.

4. *Mocyta fungi* (Gravenhorst)

CANADA. British Columbia: Vancouver, Stanley Park, Vancouver Aquarium, CWH (49°18′02″N, 123°07′04″W), Pitfall trap 4, 31.VII-21.VIII.2007, J.A. McLean, A. Li, J. Derhousoff (UBC) 1 female; Vancouver Aquarium, Pitfall trap 2, 29.IV-10.V.2007, J.A. McLean, A. Li, J. Derhousoff (UBC) 1 female.

Mocyta fungi is a cosmopolitan species, which most likely arrived in North America from Europe where it is represented by both sexes or by females only. In most other locations including Canada, it is represented only by females. Smetana (2004) recorded it from Europe, North Africa, Asia and North America. Gusarov (2001–2003) reported it from New Brunswick and Majka and Klimaszewski (2008) reported it from Nova Scotia and Prince Edward Island. Most specimens from these locations were collected from agricultural fields with a few from coastal habitats (Majka et al. 2008). Gouix and Klimaszewski (2007) recorded it from Labrador, Newfoundland, New Brunswick, Quebec, and Ontario, Klimaszewski et al. (2008) provided new records from Yukon and Alaska, and Majka and Klimaszewski (2008) provided new records from the interior of British Columbia. *Mocyta fungi* is here newly recorded from coastal British Columbia.

Tribe Homalotini Heer
(For literature review and diagnosis, see Klimaszewski et al. 2004).

Subtribe Bolitocharina Thomson

***Leptusa gatineauensis* Klimaszewski and Pelletier**
(For details and illustrations, see Klimaszewski et al. 2004).

CANADA. British Columbia: Vancouver, Stanley Park, Hollow Tree, CWH (49°18′22″N, 123°09′11″W), Funnel trap 1, 29.IV-10.V.2007, J.A. McLean, A. Li, J. Derhousoff (UBC) 1 female; Vancouver Aquarium, CWH (49°18′02″N, 123°07′04″W), Funnel trap 1, 10.V-23.V.2007, J.A. McLean, A. Li, J. Derhousoff (UBC) 1 female.

Leptusa gatineauensis was described by Klimaszewski et al. (2004) on specimens from Nova Scotia and Ontario. It was then reported from Alberta by Majka and Klimaszewski (2008).

Table 1. List of rove beetles captured in Stanley Park, Vancouver, BC, Canada. Subfamilies and species are listed alphabetically. New distributions are in bold. Adventive species are marked with an asterisk (*). Canadian provinces and territories and American states are abbreviated. Site A is located in the area adjacent to the Vancouver Aquarium and site B along the Rawlings Trail near the Hollow Tree.

Subfamilies and species	Distribution in Canada	Collecting sites in Stanley Park	Collecting period	Number of specimens captured	Depository
ALEOCHARINAE					
Amischa sp. 1	BC	A	VIII–X	1	LFC
Amischa sp. 2	BC	A, B	V, VIII, X	3	LFC, UBC
Aleochara fumata (Gravenhorst)*	AB, BC, MB, NB, NS, ON, PE, QC, YT	A	VII–VIII	1	UBC
Atheta (Dimetrota) hampshirensis Bernhauer	AK, BC, NB, NS, QC	A, B	VII, VIII	2	UBC
Atheta (Atheta) ringi Klimaszewski	BC	A	VI–VII	1	UBC
Atheta (Alaobia) ventricosa Bernhauer	AK, BC, ON, NB, YT	A, B	IV, VI, VII, VIII	20	LFC, UBC
Dalotia coriaria* (Kraatz)	AB, ON, **BC**	B	VII	1	UBC
Leptusa gatineauensis Klimaszewski	ON, QC, NS, **BC**	A, B	IV, V	2	UBC
Mocyta fungi* (Gravenhorst)	ON, QC, NB, NF & LB, NS, **BC**	A	IV–V, VII–VIII	2	UBC
Oxypoda opaca* (Gravenhorst)	ON, NS, **BC**	A	IV–V	1	UBC
***Oxypoda stanleyi* Klimaszewski & McLean sp. n.**	**BC**	A, B	IV–VII	26	LFC, UBC
Placusa tacomae Casey	YT, NT, BC, AB, ON, QC, NS	A, B	V, VI, VII	5	UBC
Placusa vaga Casey	BC, QC	A	VII	1	UBC
Stictalia californica (Casey)	BC	A, B	V, VII, VIII–X	4	UBC
MICROPEPLINAE					
Micropeplus punctatus LeConte	AK, BC	A, B	V, VI, VII	4	LFC, UBC
OMALIINAE					
Acrulia tumidula (Mäklin)	AK, BC	A	IV	1	UBC
Anthobium fimetarium (Mannerheim)	AK, BC	B	VIII–X	3	UBC
Amphichroum maculatum Horn	BC	B	VI	1	UBC
Deinopteroloma subcostatum (Mäklin)	AK, BC	A, B	V, VI, VIII, X	12	UBC

Subfamilies and species	Distribution in Canada	Collecting sites in Stanley Park	Collecting period	Number of specimens captured	Depository
Eusphalerum pothos Mannerheim	AK, BC, AB, ON, QC, NB, NS, NF	B	IV, V, VI	18	UBC
Hapalaraea megarthroides (Fauvel)	BC, AB	B	VIII–X	1	UBC
Phloeonomus laesicollis (Mäklin)	AK, BC, AB, ON, QC, NS, NF	B	VII	1	UBC
OXYTELINAE					
Oxytelus laqueatus (Marsham)*	AK, BC, YT, AB, SK, MB, ON, QC, NB, NS	A, B	VII, VIII	8	LFC, UBC
Syntomium grahami Hatch	AK, BC, QC, NB, NF	A	VI–VII	1	UBC
PAEDAERINAE					
Lathrobium sp.	BC	B	VI–VII	1	UBC
PROTEININAE					
Megarthrus pictus Motschulsky	AK, BC	A	VIII–X	1	UBC
Proteinus limbatus Mäklin	AK, BC, ON	B	VIII–X	2	UBC
PSELAPHINAE					
Oropus striatus (LeConte)	BC	A, B	IV, V, VI, VII, VIII–X	13	UBC, UNH
STAPHYLININAE					
Dinothenarus pleuralis (LeConte)	BC, AB	A	IV, V, VI, VIII	12	LFC, UBC
Gabrius virilis (Horn)	BC	A	IV–V	1	UBC
Quedius crescenti Hatch	BC	A, B	VII, VIII	6	CNC, LFC, UBC
TACHYPORINAE					
Mycetoporus sp.	BC	B	V	1	
Tachinus crotchi Horn	BC	A, B	VII, VIII	7	LFC, UBC
Tachinus nigricornis Mannerheim	AK, BC, AB	B	VII	1	UBC
Tachinus semirufus Horn	AK, BC	A, B	V, VI, VII	20	LFC, UBC

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Corrigenda to:

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The following changes should be made: p. 44, Figs 99–107, change *Gnypeta brincki* to *Gnypeta caerula*, and p. 57, Figs 139-147, change *Gnypeta brincki* to *Gnypeta carbonaria*.